

## **REMARKS**

### **I. Introduction**

The Office Action mailed November 24, 2010, has been carefully considered. The present Amendment is intended to be a complete response thereto and to place the case in condition for allowance.

### **II. Status of the Claims**

Claims 7-12 and 14-20 are pending. Claims 1-6 and 13 have been cancelled. Claims 7, 8, 11, 14, 18, and 19 have been amended. Support for the claim amendment to claims 7 and 14 is found, *inter alia*, in the specification in paragraph [0031] on pages 10-11, and in Figure 3. Claims 8, 11, 18, and 19 have been amended to provide antecedent basis for “the step.”

### **III. Summary of the Office Action**

In the Office Action, the Examiner rejected

- 1) claims 8, 11, 18, and 19 under 35 U.S.C. § 112, second paragraph, as being indefinite; and
- 2) claims 1-12 and 14-20 under 35 U.S.C. § 103(a) as being obvious over Kodas et al. (U.S. Patent Application Publication No. 2003/0108644).

### **IV. Arguments**

Applicants respectfully traverse the rejections for the following reasons:

**A. The claims are not indefinite**

Claims 8, 11, 18, and 19 stand rejected as being indefinite. The Examiner alleges that the claims lack antecedent basis for “the step.” Applicants have amended the claims to recite “a step” instead. That amendment should obviate the rejection. Accordingly, Applicants respectfully request withdrawal of the rejection.

**B. The claims are not obvious**

Claims 1-12 and 14-20 stand rejected as being obvious over Kodas et al. Applicants respectfully traverse the rejection.

Kodas et al. fail to disclose or suggest every element of the claimed invention. In particular, Kodas et al. fail to disclose a method for bonding or connecting an electrical component to a substrate. The Examiner alleges that “the under bump metallization is ‘for forming an interconnect which performs at least one mechanically, thermally or electrically connecting a device to a substrate.’” Office Action at 2-3. Applicants respectfully submit that such characterization is erroneous and that the under bump metallization (UBM) cannot be equated with the paste of the present invention. UBM is a process used to coat the surface of a substrate or silicon chip with a sequence of metal thin films so that solder bumps can adhere strongly to the surface. UBM is widely used in the electronics industry for improving the solderability of substrate or silicon surface.

To bond a silicon chip on a substrate, one may or may not need to use UBM to treat the two mating surfaces. It depends on what bonding or “gluing” material is used to join the two surfaces

together. If a solder material is used, UBM will likely be needed on both surfaces; if an epoxy is used, one may or may not need UBM to treat the surfaces. UBM is a surface treatment process to improve soldering. The paste of the present invention is used as a solder substitute; thus, it is more comparable to the solder rather a surface treatment like UBM. The UBM does not bond or connect an electronic device to a substrate. It merely prepares the surfaces for adhesion to the solder material, which actually bonds the two components together.

The disclosure of Kodas et al. also indicates no intention to use the composition to bond an electrical component to a substrate. In Kodas et al., the precursor material is deposited and forms the electrical features in a recessed structure or trench by a low-temperature reaction process – the precursors are not the final material or compound. Nowhere does the reference mention attachment between two articles, such as bonding or connecting an electrical component to a substrate. The purpose of Kodas et al. is to form an electrically conductive feature on a recessed surface, such as UBM.

Further, Kodas et al. disclose that that the viscosity of the precursor material is not important. *See paragraph [0039].* That disclosure shows that Kodas et al. do not intend to use their composition as a bonding agent. Low viscosity usually means low solid loading. Eventual volatilization of the solvents and other organics will cause large shrinkage in the bond, resulting in cracks and delaminations causing low bond strength. That is not desirable for a bonding agent. Even the highest viscosity mentioned by Kodas et al. (10,000 centipoise) is still too low to produce a paste that can function as a bonding agent. Additionally, in paragraph [0135], Kodas et al. specifically teach against using high viscosity compositions, which, as discussed above, is undesirable for forming a strong bond between an electrical component and a substrate.

Thus, overall, Kodas et al. do not teach or suggest bonding or connecting an electrical device to a substrate using the metal paste of the present invention. The composition of Kodas et al. is for forming electrical features, such as conductors, resistors, and dielectric features on a substrate, not for bonding a substrate to an electrical component.

For the reasons noted, the present invention is not obvious over Kodas et al. Accordingly, Applicants respectfully request withdrawal of the rejection.

**C. The Examiner has failed to comply with the Office's policy of "compact" prosecution**

Throughout the prosecution of the present application, the Examiner has repeatedly reapplied references that have been previously addressed and overcome. For example, in the Office Action mailed February 18, 2009, the Examiner rejected the claims as being obvious over Kang et al. in view of Kydd. After Applicants successfully traversed that rejection, the Examiner rejected the claims over Basol in view of Kodas et al. See Office Action mailed July 10, 2009. After Applicants successfully addressed the rejection over Basol and Kodas et al., the Examiner reapplied Kydd in an obviousness rejection. See Office Action mailed July 7, 2010. After Applicants overcame Kydd for a second time, the Examiner reapplied Kodas et al. in yet another obviousness rejection (which is addressed above). Each time the Examiner reapplied the references, he reinvented new bases for rejecting the claims.

According to MPEP 2106(II),

It is essential that patent applicants obtain a prompt yet complete examination of their applications. Under the principles of compact prosecution, each claim should be reviewed for compliance with every statutory requirement for patentability in the initial review of the application, even if one or more claims are found to be deficient with respect to some statutory requirement. Thus, USPTO personnel should state all reasons and bases for rejecting claims in the first Office action ... A failure to follow this approach can lead to unnecessary delays in the prosecution of the application.

In the present case, the Examiner failed to state all reasons and bases for rejecting the claims in the first office action. For example, all grounds for rejection over Kydd should have been stated in a single office action, instead of over two different, discontinuous office actions. Similarly, all grounds for rejection over Kodas et al. should have been stated in a single office action, instead of over two different, discontinuous office actions. Additionally, the Examiner's consecutive non-final office actions are clear evidence of his failure to comply with the Office's compact prosecution policy. The Examiner's piecemeal examination flouted the Office's compact prosecution policy and led to needless and unnecessary delay. Applicants request that the Examiner refrain from piecemeal examination and provide Applicants with prompt and complete examination of the application.

## V. Conclusion

Applicants have responded to the Office Action mailed November 24, 2010. All pending claims are now believed to be allowable and favorable action is respectfully requested.

In the event that there are any questions relating to this Amendment or to the application in general, it would be appreciated if the Examiner would telephone the undersigned attorney concerning such questions so that the prosecution of this application may be expedited.

Please charge any shortage or credit any overpayment of fees to BLANK ROME LLP, Deposit Account No. 23-2185 (124617.0118). In the event that a petition for an extension of time is required to be submitted herewith and in the event that a separate petition does not accompany this response, Applicants hereby petition under 37 C.F.R. 1.136(a) for an extension of time for as many months as are required to render this submission timely.

Any fees due are authorized above.

Dated: March 11, 2011

Respectfully submitted,

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